



UNIVERSITY OF WARSAW

Faculty of Economic Sciences

WORKING PAPERS

No. 13/2010 (36)

ANNA GROCHOWSKA
PAWEŁ STRAWIŃSKI

IMPACT OF SOCIAL CAPITAL ON INDIVIDUAL WELL-BEING IN POLAND PROXY-BASED APPROACH

WARSAW 2010



UNIVERSITY OF WARSAW

Faculty of Economic Sciences

Impact Of Social Capital On Individual Well-Being In Poland

Proxy-Based Approach

Anna Grochowska

Faculty of Economic Sciences, University of
Warsaw

e-mail: anna.grochowska@compete.pl

Paweł Strawiński

Faculty of Economic Sciences, University of
Warsaw

e-mail: pstrawinski@wne.uw.edu.pl

Abstract

In this paper we attempt to quantify the impact of social capital on individual well-being. We follow the Putnam (1995) approach and select five key social capital components to construct a synthetic index for social capital using a multivariate probit model. Social capital is considered as one of the three crucial individual endowments: physical capital, human capital and social capital. The impact of the synthetically constructed social capital index on individual's well-being is estimated using a Mincer type earning equation. The results show that social capital explains up to 20% of income variation both at individual and household level. However, human capital and physical capital remain the critical determinants of individual income.

The research was conducted in the framework of research project Civilization Competences and sustainable development of Polish regions (PL0104 COMPETE) and funded by EEA grant and Norway grant (85%) as well as by Polish Ministry of Science and Higher Education (15%).

Keywords:

social capital, income, well-being, local community, household.

JEL:

A14, 018

Working Papers contain preliminary research results.

Please consider this when citing the paper.

Please contact the authors to give comments or to obtain revised version.

Any mistakes and the views expressed herein are solely those of the authors.

I. INTRODUCTION

Economic growth and prosperity do not always lead to an increased quality of life. Rapid technological development and scientific progress are often accompanied by social change. The concept of social capital has been gaining importance over the last few decades in explaining certain aspects of an individual's overall well being. An important question articulated by various stakeholders and social researchers is why some individuals or communities with a given set of material assets are able to prosper over others. The principles behind social capital help provide some explanation to this question.

As the phenomena of social cohesion and social inclusion have become high on the agenda of policymakers, social capital has become a resource for policy makers to combat social exclusion (Daly, 2000). The recognition of the importance of social capital has also resulted in a growing pressure both at a global and local scale to define and measure the distribution of social capital. A range of definitions attempting to explain the concept exist which leads to confusion about what really constitutes social capital. The common feature of most definitions is the focus on productive benefits of social relations. However, due to the wide variety of approaches, the definitions of social capital have a rather context-specific nature. As such, a consistent definition of social capital does not exist and its determinants remain unclear.

The objective of this paper is threefold. First, we look into the concept and determinants of social capital on the basis of a Polish socio-economic survey data. Following Putnam's (1995) index approach we select the key social capital components and identify their measures. Second, we analyse the distribution of the chosen determinants across the examined population and construct a synthetic index of social capital on the grounds of the realization of selected manifest variables. Finally, in order to measure the impact of the synthetically constructed social capital index on individual well-being we estimate the relationship between individual income and three kinds of endowments: physical, human and social capital.

Our approach consists in using a multivariate probit model to construct a single index of social activity. We utilise a unique and detailed individual socio-economic dataset collected at the level of local government, which allows for inter-regional comparisons of social development. The paper is organised into the following section: Sections 2 and 3 review the importance and definitions of social capital used in the literature. Section 4 provides a

descriptive analysis of the data set. Section 5 describes our modelling strategy, summarises empirical findings and discusses their implications and in Section 6 we provide our final conclusions.

II. IMPORTANCE OF SOCIAL CAPITAL

The interest in social capital theory has been increasing in recent years, mostly due to its wide application to various disciplines and numerous subject areas. One interesting feature of social capital is the fact that it integrates sociology and economics. It combines a number of diverse ideas such as civic tradition, social engagement, norms, trust, formal and informal interpersonal bonds (Claridge, 2004).

Overall, well-being does not necessarily depend on monetary wealth. Governments and societies seek economic growth, but are also increasingly concerned about its impact on natural and social environments (OECD, 2001). Social capital is an important aspect of individual well-being and social deprivation or social isolation are aspects of poverty, alongside issues such as inadequate housing or clothing. However, social capital is not only an aspect of individual well-being, it is also a factor influencing economic and sociological outcomes both at micro and macro level.

Putnam (1995) argues that social capital has forceful, quantifiable effects on many different aspects of our lives. These quantifiable effects include: lower crime rates (Halpern 1999, Putnam 1995), better health (Wilkinson, 2009; Hendryx et al, 2002), improved longevity (Putnam, 1995) better educational achievement (Coleman, 1988), greater levels of income equality (Wilkinson 1996, Kawachi et al. 1997), improved child welfare and lower rates of child abuse (Cote and Healy, 2001; Gordon and Jordan, 2006), less corrupt and more effective government (Putnam, 1995; Kingston, 2005) and enhanced economic achievement through increased trust and lower transaction costs (Fukuyama, 1995).

Buonanno et al (2009) look into the effects of civic norms and social networks on crime rates across Italian provinces. The authors argue that civic norms raise the expected returns to crime through their impact on trust and economic development. What is more, social bonds may provide communication channels for criminals. However civic norms significantly increase the opportunity cost of crime and the feelings of guilt and shame attached to it. In

addition, social networks encourage returns to non-criminal activities and raise the probability of detection so the influence of social capital on crime rates remains ambiguous.

Hendryx et al (2002) put forward a positive relationship between social capital and health. The authors examine how access to health care contributes to social and community characteristics such as income distribution, sense of community, and social networks. According to Hendryx et al (2002), the relationship between social capital and health operates through stress. Hendryx et al. (2002) note that US communities assume more and more responsibility for improving the health status of citizens by initiating new collaborative institutions such as community care networks, which combine available assets in more efficient and effective ways.

Gordon and Jordan (2006) suggest a linkage between the erosion of social capital, rising economic inequalities and worsening developmental outcomes for UK children. The authors believe that social exclusion and isolation have negative impacts on parenting capacity. Family cohesion and children's welfare are highly dependant on the social support available within local communities. The authors argue that building social capital in poor communities is a more effective way of promoting children's welfare than the present measures such as: formal child protection, family support services and efforts to increase parenting skills and responsibilities.

Kingston (2005) uses a linked games model to show how social capital, viewed as trust generated through repeated interactions in games, can help the Indian society to enforce social norms against bribery. Using an empirical test Kingston (2005) explores variations in the frequency with which officials are transferred between posts in Indian states. Kingston (2005) proves that social capital influences the transfer frequency in Indian states.

According to Fukuyama (1995) transaction costs may be lowered as a result of cooperation and trust embodied in inter-firm or intra-firm networks. Trust and social bonds lower the costs associated with negotiation, enforcement, imperfect information and unnecessary bureaucracy (OECD, 2001). Relationships between business people marked by initiative, trust and expectations of reciprocal support can be useful in times of need.

III. DEFINITION AND MEASUREMENT

The notion of social capital has been around for decades and although its importance is increasing it remains poorly understood. A wide range of definitions trying to capture the phenomenon exists. The term social capital came into prominence through the work of three authors: Pierre Bourdieu (1983), James S. Coleman (1988) and Robert D. Putnam (1995). Coleman (1988) and after him Bourdieu (1997) define social capital as the network of connections that one can mobilize. For Putnam (1995) social capital consists of social life-networks, norms and trust which enable participants to act together and pursue shared objectives. An important difference between Putnam and his predecessors is that Coleman and Bourdieu consider social capital as an attribute of an individual whereas Putnam perceives it as a collective feature. While Bourdieu's definition (1997) puts forward the individual advantage of maintaining social networks, Putnam (1995) sees benefits for effective functioning of communities and society as a whole.

Putnam is undoubtedly one of the most well known theorists within the social capital paradigm. His definition emphasises the role of networks and civil norms. "Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam, 1995).

International organizations have developed their own definitions of the term. OECD (2001) describes social capital as "networks, together with shared norms, values and understandings which facilitate cooperation within or among groups". The World Bank (1999) defines social capital as institutions, relationships, and norms that shape the quality and quantity of interactions with family members, peers, community members, local institutions, and at the broadest level, with society. "Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together (World Bank, 1999).

There is considerable debate and controversy over the possibility of measuring social capital. Both OECD and the World Bank are currently progressing work on the measurement of social capital. Measurement attempts are flawed by problems with separating form, source and consequences (Adam and Roncevic 2003; Onyx and Bullen 2001). An example may be trust, which is commonly seen as a component of social capital. Some authors equate trust with

social capital (Fukuyama 1995), some see trust as a source of social capital (Putnam et al. 1993), some see it as a form of social capital (Coleman 1988), and others see it as a collective asset resulting from social capital construed as a relational asset (Lin 1999).

Due to the abovementioned difficulties, the measurement of social capital heavily relies upon pre-assumptions and available socio-economic indices. The search for a universal measure continues, with improvements in information systems and increasing availability of local information driving the development of more complex and more comprehensive indices. An important approach comes from Putnam (1995) who distinguishes five components of social capital: community organizational life; engagements in public affairs; community volunteerism; informal sociability and trust. Based on these five axes Putnam (1995) puts forward a set of observable measures expressing every dimension.

Putnam proposes a variety of measures for community organisational life: serving on the committee of a local organisation, serving in office for a club or organisation, number of civic and social organisations per one thousand inhabitants, mean number of club meetings attended during a year, mean number of group memberships. As a measure of engagements in public affairs Putnam suggests: the turnout in presidential election and participation in public meeting on town or school affairs. As a measure of community volunteerism Putnam postulates: the number of non-profit organisations per one thousand inhabitants, mean number of times worked on community project and the mean number of volunteer placements during a year. As a measure of informal sociability Putnam proposes: spending a lot of time visiting friends and mean number of times entertained at home during the last year. As a measure of trust Putnam suggests: susceptibility to trust others and the belief that most people are honest.

IV. DATA DESCRIPTION AND DESCRIPTIVE ANALYSIS

We use the COMPETE database to quantify social capital, which is an independent socio-economic survey covering various aspects of life: household demographic structure, economic activity, work situation, wealth, living conditions, income, involvement in sports and cultural activity. The sample is representative, however covers only five selected municipalities (gminas) at the lowest level of territorial division in Poland: Gostyń, Gliwice, Manowo, Małogoszcz and Zgierz.

Gostyń represents economically developed local municipalities from the Wielkopolskie, rich in civic associations and cultural organisations. Gliwice lies in the Upper Silesia conurbation, a large industrial and post industrial area where mines and steel mills used to be dominant manufactories. Manowo represents a poor, rural area of the Zachodniopomorskie. Małogoszcz lies in a poor rural area of central Poland, in the Swietokrzyskie region and Zgierz is a rural area in the suburbs of Lodz. A geographically diversified sample gives us an opportunity to compare the level of social capital in various regions of Poland.

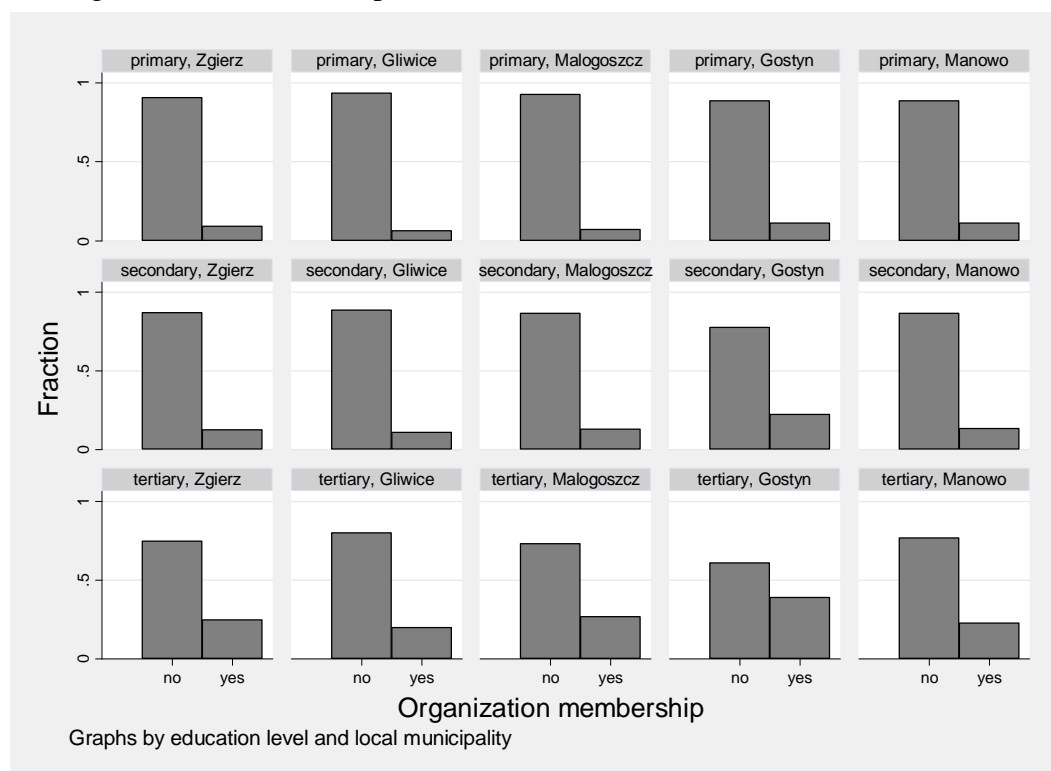
The sample contains 500 individual observations for each local municipality. Unfortunately, not all respondents have answered all questions, which is a common problem in socio-economic research. Consequently, the sample used in the model is smaller. Consistent with Putnam's five axes we selected five variables describing social capital: organization membership, participation in local elections, volunteer behaviour, size of social network and trust.

The organisation membership indicator was constructed as a dummy variable taking a value of 1, when respondent answers "yes" to at least one of the following questions:

- Are you a member of a political organisation or a political party?
- Are you a member of professional society?
- Are you a member of a trade union?
- Are you a member of a religious organisation?
- Are you a member of a sport club?
- Are you a member of a non-government organisation?

Only few respondents declared participation in more than one type of organisation. The predominant answers were: non-government organisations (4.68%), trade unions (4.64%) and sport clubs (3.30%). 2.92% of interviewees declared membership in professional societies, 2.83% of interviewees declared membership in religious organisations. Only 0.96% of the surveyed population declared membership in political organisations.

Figure 1. Organization membership across local communities and education levels



Source: COMPETE 2010.

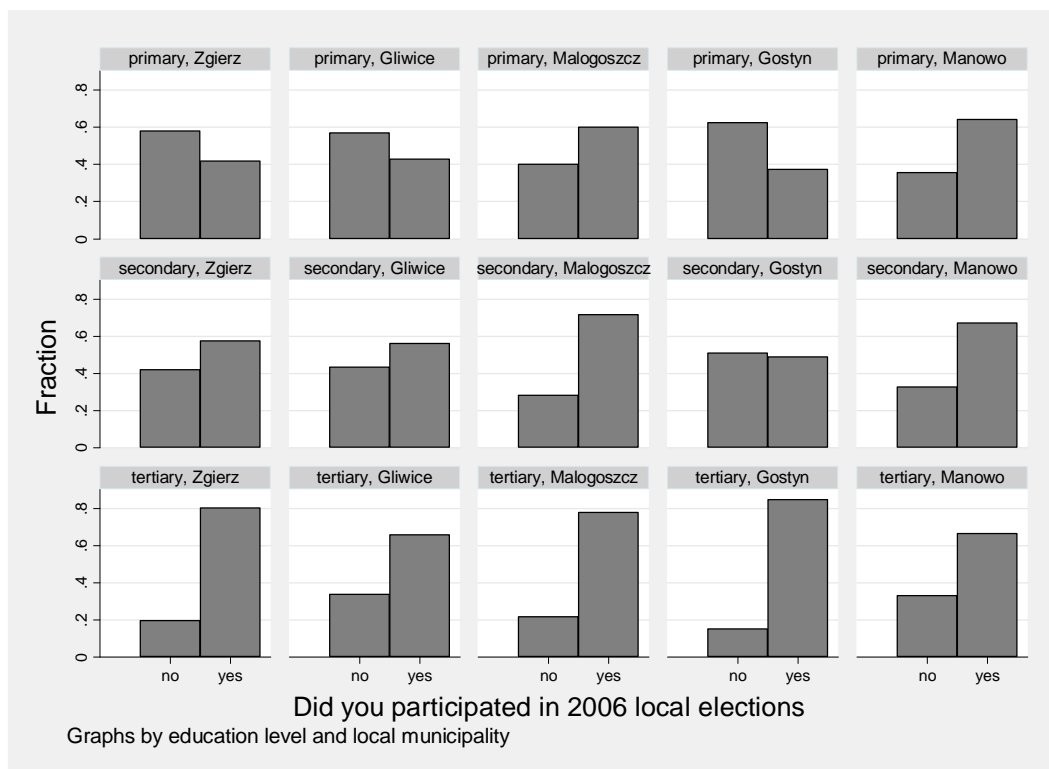
As expected, organization membership rate rises along with education level. Less than 9% of respondents who completed primary education, over 15% of respondents who completed secondary education and 23.8% of those with tertiary education declare membership in organizations.

Looking across the analysed local municipalities we observe the highest organisation participation rate in Gostyn (20.4%). On the other edge is Manowo with hardly 9% participation. In the remaining communities the organization membership is between 12% and 14%.

Declared participation in local elections in 2006 is another component of Putnam's measure of social capital. An important measurement problem here is that declared participation rates differ dramatically from official statistics. Large data discrepancies were noted for Manowo (Zachodniopomorskie), where over 63% of respondents declared that they participated in elections while according to the National Electoral Commission (NEC) the participation rate was only 47.21%.

Nevertheless, even if the declared participation is overstated, some interesting patterns can be observed. Overall, a higher voting participation goes along with higher education level. Surprisingly, the lowest participation in elections was declared in Gostyń. However, this may have been the result of false positive answers given in the other communities. In the official NEC statistics Gostyń is among local municipalities with the highest rate of participation in elections.

Figure 2. Local participation in elections across local communities and education levels



Source: COMPETE 2009.

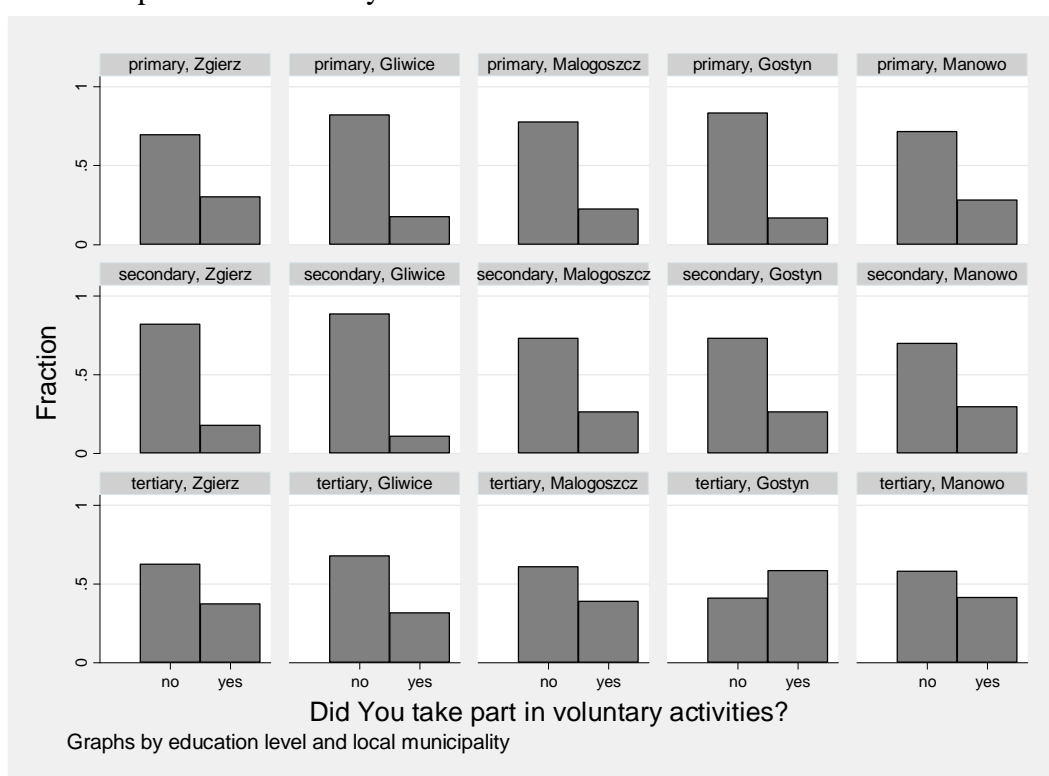
The third dimension of social capital was volunteerism. The indicator was built upon answers to the following question:

- Did you work voluntarily for: a school / a kindergarten / a church / a firm / an organisation / other persons during the last 12 months?

Nearly a quarter of the surveyed population (22.83%) pointed out at least one type of organisation for which they worked voluntarily. 14.09% of respondents declared working for other persons, while 9.72% declared working voluntarily for a school. 7.1% of respondents worked voluntarily for a church, 4.7% worked voluntarily for a firm and 3.9% worked voluntarily for another organisation.

The distribution of the volunteering behaviour was similar in all communities. The lowest rate was noted in Gliwice while the highest rate was observed in Gostyń and Manowo. The differences were small and related to the size of a local community. In a village or small town people know each other better and support each other more than residents of bigger cities. We found a positive relationship between volunteerism and education level. Commitment to volunteerism was declared by 18% of respondents who completed primary education, by 20% of respondents who completed secondary education and by 37% of those who completed tertiary education.

Figure 3. Participation in voluntary activities across local communities and education levels

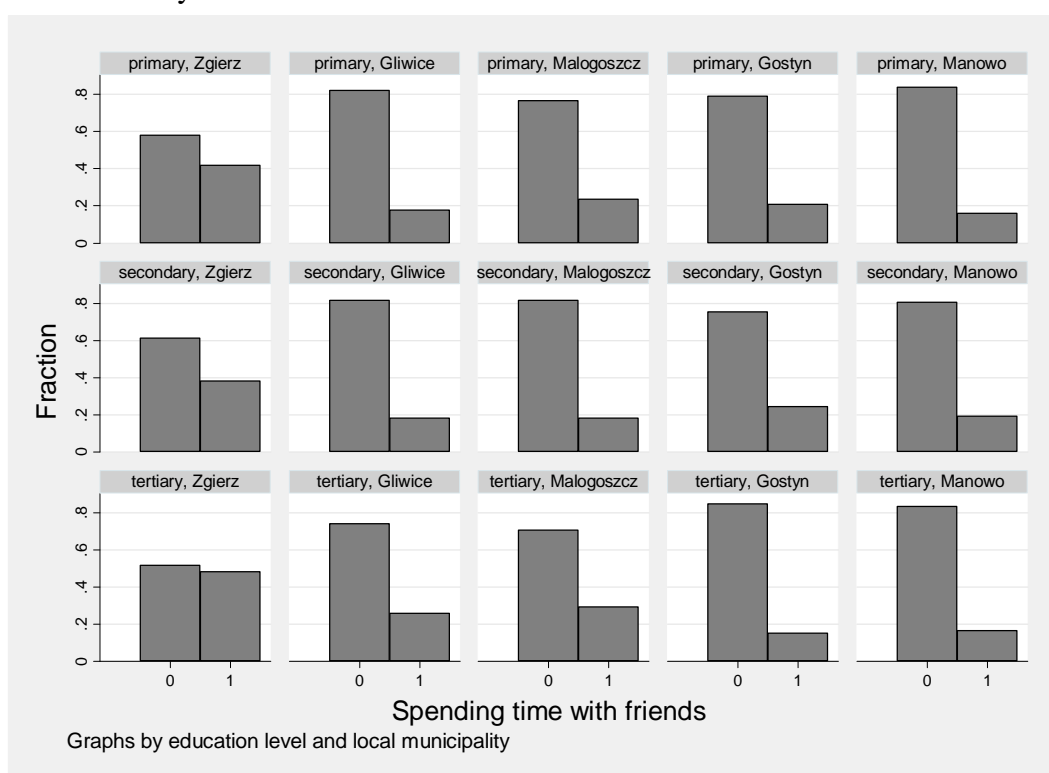


Source: COMPETE 2009.

The fourth dimension of social activity was the size of the social network. The true magnitude of a social network is hard to capture quantitatively for several reasons. First, the number of interpersonal contacts is affected by other factors, for instance, type of job. Secondly, not all social connections have the same strength. Thirdly, existing connections differ in quality. Notwithstanding the above-mentioned limitations, we use a number of meetings with friends as a proxy for social activity. The indicator takes the value of 1 if one declares meeting friends at least once a week.

In most communities the share of respondents meeting friends at least once a week oscillates at 20%. The odd one out was Zgierz with nearly 40% of respondents declaring frequent contacts with friends. No significant differences were noted with regard to educational background. However, only 24% of respondents with primary education declared frequent contacts with friends. For the secondary education group the percentage of respondents having regular contacts with friends was 28% and for the tertiary education group - 30%.

Figure 4. Sociability across local communities and education levels



Source: COMPETE 2009.

The last dimension of social activity was trust. Trust is an important determinant of social interactions. People tend to behave differently in a friendly environment (where they can trust other actors) than in hostile surroundings. The trust indicator was constructed on the basis of the following question:

- Do you believe that you can trust almost every person / you can trust most people / you cannot trust most people / you can trust hardly any person?

The variable equals 1 if respondent chooses the first or the second option.

The trust indicator was diversified among communities. The highest value (49.76%) was reported in Gliwice and in Zgierz (45.76%). In the remaining communities the indicator was at a level below 40% (Manowo 39.68%, Gostyn 37.21%, Małogoszcz 30.17%). Trust turned out to rise with the level of attained education. Only 35.38% of respondents with primary education reported that they trust most people. For respondents who completed secondary education the number was 40.88% and for respondents who completed tertiary education the trust indicator equalled 55.69 %.

Looking at the geographical and educational dimension at the same time, we can spot an interesting pattern. Over 50% of respondents who completed primary and secondary education do not trust others whereas for respondents who completed tertiary education the situation is reversed. The findings for Małogoszcz and Gliwice are not consistent with this. Małogoszcz is characterised by the lowest trust level. For all education levels respondents who do not trust others outnumber those who trust others. In Gliwice, the interviewees who completed secondary education are evenly split between those who trust and those who do not trust others.

Figure 5. Trust across local communities and education levels



Source: COMPETE 2009.

V. EMPIRICAL FINDINGS AND IMPLICATIONS

The main challenge in our research was to construct a proper measure of social capital. We use a two stage modelling strategy in this paper. In the first step, following Putnam's five axes approach we apply a multivariate probit model to build a social activity index. In the second stage, we regress personal and household income on three endowments: physical capital, human capital and the synthetically constructed social activity index. The socio-demographic characteristics, commonly used in Mincerian-type wage equation serve as control variables. Their role is to rule out idiosyncratic differences between individuals.

On the grounds of the well established Colman's and Bordieu's perspective we interpret social capital as a feature of individuals. Having data for one moment in time only, we concentrate on the intrinsic value of social capital for individual present returns. We ignore the impact of social capital on future returns. We match each of the five social capital axes with one manifest variable from the survey. As explanatory regressors we use standard socio-demographic and psychological variables.

The model is analogous to the model used by Platt (2006) to assess the impact of various health measures on social activity. In our setting, the model consists of five equations, one for each social activity dimension. All five equations are estimated simultaneously. This approach allows for flexible associations between the independent and each of the dependent variables. At the same time the model allows for non-zero correlations among unobservable characteristics specific to each dimension. If all these correlations are equal to zero, then the model collapses to a series of univariate probits. However, if correlations are different from zero, it means that equations should be modelled together.

As a measure of group membership we used a variable indicating the fact of belonging to a political party, religious organization, trade union, sport club or NGO. Engagement in community life reflects positive attitude to self-organization and cooperative actions. However, in a post-socialist country where organization membership was obligatory before transition we expect that only unusually active persons would be members of social organizations. The vast share of the population lives on its own and is not interested in participating in formal organizations.

Participation in local elections was the manifest variable for engagement in public affairs, we used. The rate of participation in local elections is usually much lower than in general elections and therefore is a good proxy for civic engagement in local community issues. The measure of volunteerism was engagement in performing unpaid work for non-profit organisations. Regions with a high degree of volunteerism are viewed as open and better developed socially. As a manifest variable for informal sociability we selected the frequency of meeting friends. Spending time with friends is an indicator of the level of individual socialisation. The more friends one has, the more prone she or he is to undertaking common actions.

We separated all available characteristics into two sets. The first set was common for each dimension and consisted of standard social and demographic measures, such as gender, indicator of having a partner and a dummy for town size: over / under 100ths inhabitants with village as a reference category. We did not use age and education at this stage to avoid identification problems in the second stage of the regression.

Each equation was identified with specific characteristics for each dimension. In the first equation the following variables were included: car skills, information-related variables (gathering information from TV or from the Internet), working status and participation in on-the-job training. We believe that all these specific skills are necessary for active membership in organisations. The specific variables in the second equation were: information-related variables and an indicator for petition signing. In our opinion people who are interested in political and economic issues are more likely to participate in elections. In the third equation identification was achieved through car skills, internet usage, partial employment and health indicators. The first two indicators express personal skills and the two remaining characteristics describe the potential for volunteerism. We assume that individuals who possess available time and who are in a good health condition are more likely to participate in voluntary activities. The fourth equation representing time spent with friends was identified through car skills, possessing a mobile phone, smoking habit, having children, personal weight, doing sport and having a hobby. We believe that all these indicators make a person more likely to spend time with friends. The last equation, describing trust, was identified through propensity to cheat on exams, tax avoidance, tolerance, and proneness to be affected by a marketing action, proneness to become a crime victim, risk-taking behaviour and reading

contracts carefully before signing. All these characteristics reflect personal attitudes to various real-life situations.

Table 1. Multivariate probit estimates

Multivariate probit (MSL, # draws = 100) Number of obs = 2422
Wald chi2(49) = 653.13
Log likelihood = -6463.5779 Prob > chi2 = 0.0000

	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5
Variable	Organization membership	Voting participation	Volutereesm	Time with friends	Trust
gender	.2730***	.0023	.0468	.0235	-.1080*
partner	-.1904***	.3999***	.0516	-.3816***	.1234**
town to 100th	-.1387	.3073***	-.0126	.2746***	.1814**
town	-.1466**	.2914***	-.07667	-.0322	.1616***
car skills	.0400	.3148***	.2733***	-.2027***	
information on TV	.3517***	.1441*	.1840***		
internet	.3415***	-.2188***			
housework	.0518				
part time employed	-.0824		.2874**		
happy at work	.0923				
on work training	.2968***				
petition signing		.4122***			
health condition			-.0144		
mobile phone				.3090***	
smoke				.1209*	
number of children				-.1190*	
weight				-.0002	
sport				.3453***	
hobby				.2694***	
cheat					-.1280*
tolerance					.0244***
marketing					-.1257***
crime victim					.0215
cheat on tax					-.1511
risk taker					-.1622**
contract reader					.1039**

* significance at 10% level; ** significance at 5% level; *** significance at 1% level

Source: Own computations.

Table 2. Correlations between social activity dimensions

Organization membership	XXX	.1065***	.3891***	.0001	.1313***
Voting participation		XXX	.1890***	-.0561	.1588***
Volunteerism			XXX	.0513	.0896***
Time with friends				XXX	-.0104
Trust					XXX

* Significance at 10% level; ** significance at 5% level; *** significance at 1% level

Likelihood ratio test of independence: chi2(10) = 169.608 Prob > chi2 = 0.0000

Source: Own computations.

The likelihood ratio test of independent categories indicates that the chosen categories are correlated. In other words our approach is justified by the properties of the dataset. The numbers in Table 2 show that all dimensions but one are correlated. The odd one is the equation for time spent with friends. We believe that zero correlation is more likely to be a result of a weak proxy for socialisation than the possible limited impact of interpersonal relations on individual social capital. From the theoretical point of view, non-zero correlations can be interpreted as important interdependencies between Putnam's dimensions. The strongest relation is observed between organisation membership and volunteerism. These two dimensions describe socially active people who are likely to engage in charity actions. The distinction between these two dimensions is fuzzy in our opinion.

A number of interesting relations can be observed when looking at individual equations. In the equation representing organisation membership we can see that having a partner and living in an average sized town decreases the probability of membership in an organisation while the fact of being well informed and well trained increases the probability of membership in an organisation. People who easily gather information are usually more active and have better knowledge about various types of organisations.

The estimates of the second equation are rather surprising. Most covariates turn out to be significant predictors for election participation. The only insignificant regressor is gender. Moreover, all but one factor (Internet usage) increase the probability of taking part in elections.

In the third equation we observed that factors such as: internet skills, doing a part-time job and possessing a car driving licence, all have a significantly positive influence on the probability of doing a volunteer action. People who work part time usually have spare time which they can spend on charity actions. Internet access and car skills are additional assets that can be used in charity work.

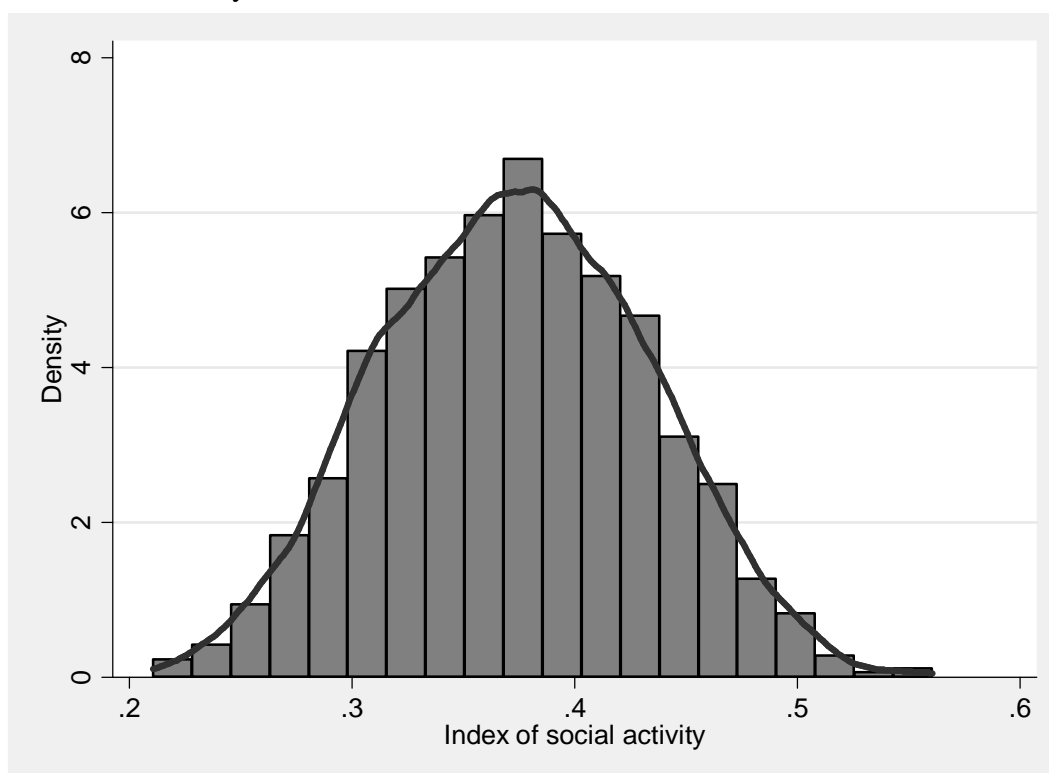
Most of the chosen covariates in the fourth equation (describing time spent with friends) were statistically significant. A negative correlation could be observed between the time spent with friends and having a partner or children. These results are in accord with our expectations. Persons having a partner or children usually spend more time with close relatives than with friends. A positive association was found between the amount of time spent with friends and

the fact of living in a big town. In bigger cities people usually have wider social networks. Positive coefficients for having a mobile phone or for the smoking habit indicate that these features may increase knowledge-sharing among individuals. Doing sport and having a hobby create additional opportunities to meet other people.

In the last equation the determinants of trust were modelled. Factors increasing trust in others were: tolerance, the fact of having a partner and the fact of reading contracts carefully. The first two factors may help establish positive relations with other people. Reading contracts may be related to law-abiding attitudes. A negative correlation between trust and cheating in exams, tax-avoidance, proneness to marketing, and risk taking was observed, which may indicate that persons who cheat or have been cheated have less trust towards others.

Having estimated the model parameters, we generated fitted probabilities for each indicator. Next, we added up the fitted probabilities to construct a single index. We calculated a simple weighted average of the probabilities, where weights were proportional to the share of people declaring specific activity. The distribution of the constructed index was unimodal and similar to the normal distribution.

Figure 6. Social Activity scale.



Source: COMPETE 2009.

In the second step we used a standard empirical model formulation where social activity was treated as one type of asset employed by a person or a household to generate income (Grootaert and Bastelaer, 2002). In this framework the level of income was determined by human, social and to some extent physical capital in a combination with regional and household specific characteristics. The framework for the second step was adopted from Ameen and Sulaiman (2006). The authors investigated the interdependencies between social capital and economic well-being in rural Bangladesh.

The model can be formalised in a way where personal or household income arises as a combination of different types of capital. Human capital describes personal abilities and the potential to generate income. The level of social capital determines the number of gainful interactions that one can establish with his or her economic surrounding. Some of such interactions may result in positive externalities, e.g. new job opportunities. Physical capital guarantees necessary tools and material resources. It is an important factor especially for those individuals and families who rely on self-employment. Regular workers are equipped with physical capital by their employers. The dependent variables were: personal income and household income.

The level of capital is not directly observed. We explore the available information and use proxies. The implied number of years spent at school serves as a measure of human capital. The index of household assets is a proxy for physical capital. As a measure of social capital we use the previously constructed social activity index. The Mincer type earning equation is estimated by a simple regression model.

We took advantage of some specific wage-related questions that are not usually asked in labour surveys. Instead of using information about last month's income, we used the average income of respondents from the last three months. In our opinion, the average income for a longer period better reflects earning capabilities of a person or a household than monthly income. We used age and age squared as proxies for working experience.

The full specification of the model is as follows:

$$\ln w = \beta_0 + \beta_1 \text{social} + \beta_2 \text{human} + \beta_3 \text{physical} + \beta_4 H_i \quad (1)$$

where

w = average income of survey respondents from the last three months

social = social activity index

human = human capital measured by level of education

physical = index of household endowment

H = household specific and regional characteristics, we control for local municipality and household size

In order to achieve identification of the parameters in the wage model, we omitted variables that were used to construct the social activity proxy. For that reason we could not include information about gender and regional dummies.

We estimated two wage models: one on individual and one on household level. In order to be able to compare not only signs but also magnitudes of the coefficients, we standardised all variables to have a zero mean and unit variance prior to the estimation. We used two alternative functional forms: one including age as a proxy for working experience and one without.

Table 3. Individual level estimates

Dependent Variable: Personal Income	Model 1	Model 2
Age	0.078*** (0.016)	
Age squared	-0.001*** (0.000)	
Human capital	0.269*** (0.031)	0.253*** (0.031)
Social capital	0.101** (0.034)	0.112** (0.034)
Physical capital	0.173*** (0.035)	0.191*** (0.035)
Constant	-1.687*** (0.317)	-0.090** (0.031)
R-squared	0.179	0.160
N of observations	991	991

Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, standard errors in parentheses.

Both models at individual level have desirable statistical properties. All variables are statistically significant and the explanatory power is impressive. The signs and sizes of coefficients are in accord with our expectations and the economic theory. The positive coefficient for age and negative for age square affirm increasing returns from working experience with decreasing marginal rate.

The coefficients for all types of capital are positive. The highest coefficient was found for human capital, which is normal as long as we analyse individual incomes. Roughly 50% of income is owed to human capital, 30% to physical capital and around 20% to social capital. The positive and statistically significant coefficient for the synthetic social activity proxy indicates that there is a positive influence of social capital on personal income. The more active a person is, the higher the wage premium he or she receives. One has to bear in mind that our index covers various dimensions of social activity. Some of them, like trust and sociability are very helpful at work. High level of socialisation helps a worker to quickly become a good team player. A high level of trust may be rewarded with being assigned more responsible tasks. Other factors, such as organization membership and engagement in public affairs are rather seen as obstacles slowing down professional career since they are time-consuming activities. On the other hand, there is high demand for workers with good organisational skills.

Models at household level are better fitted to data than those estimated on individual incomes. However, working experience is no longer significant. The signs and sizes of other coefficients are fairly similar in both empirical specifications.

Table 4. Household level estimates

Dependent Variable: Household Income	Model 1	Model 2
Age	0.004 (0.007)	
Age squared	-0.000 (0.000)	
Human capital	0.168*** (0.023)	0.165*** (0.022)
Social capital	0.093*** (0.023)	0.094*** (0.023)
Physical capital	0.393*** (0.024)	0.391*** (0.023)
Constant	-0.056 (0.149)	0.055** (0.019)
R-squared	0.268	0.269
N of observations	1969	1969

Significance: * p<0.05, ** p<0.01, *** p<0.001, standard errors in parentheses.

We found a higher importance of physical capital in explaining the variation of income when estimating models at household level. Almost 2/3 of household income could be attributed to this type of capital. The remaining variance in income could be explained by human capital

(26%) and social activity (14%). It should be stressed that social interactions constituted an important share of income both at individual and household level.

VI. CONCLUSION

In our research we used a unique dataset comprising a wide range of social and demographic measures at local municipality level in Poland. In the first section we followed Putnam's model of five social capital components to find determinants of social activity. Overall, the level of membership in organisations was low and it increased with the attained level of education. An interesting observation was that the rate of participation in local elections was higher than the real figures in all but one local municipality. This could mean that social involvement is perceived as a positive attitude. The rate of volunteerism was high, approximately 25% across all local municipalities.

Informal sociability was at a similar level in all local municipalities. However, we believe that the proxy variable (being the best available variable), may not have been good enough to capture the real differences. The last considered indicator was trust. Surprisingly, the trust indicator was highly diversified across local municipalities, ranging from 30% to 50% and rising with education level. It appears that less educated people have less trust to others than highly educated people.

Our main conclusion from the descriptive part was that education is an important factor stimulating social activity (across all five dimensions). In addition, noticeable differences were found among local municipalities. People living in urban areas and those living in the western part of Poland are more socially active than those living in rural areas and on the east.

Relying on the conducted descriptive analysis we constructed a multivariate probit model. Our model consisted of five equations: one for each dimension of social activity. The described approach gave us more flexibility as to the choice of parameters and lifted restrictions regarding the correlation structure between dependent and independent variables. The set of independent variables was divided into two parts: one set common for all dimensions and the other set dimension-specific. All selected variables were grounded in the economic theory.

All but one social activity dimension occurred to be correlated with other dimensions which convinced us about the fact that the chosen empirical approach was appropriate. An exception was the equation representing the sociability dimension. We believe that a non significant correlation was a side effect of a poor proxy. The literature clearly shows that interpersonal relations play an important role in generating social capital and stimulating social activity.

In the last step we generated a single measure of social capital based on the multivariate model estimates. We plugged this measure into an individual production function. Human capital explained approximately 50% of income variation at individual level. One third of income variation owed to physical capital and the remaining 20% was attributed to social capital. Results were similar at household level with a slightly lower share attributed to social capital (ca. 15%). Overall, social capital constituted a significant and unneglectable determinant of income.

BIBLIOGRAPHY

Adam Frane, Roncevic Borut (2003) Social capital: recent debates and research trends. *Social Science Information*. 42:155-183.

Ameen Farhad, Sulaiman Munshi (2006) Social capital and economic well-being, *CFPR Working Paper Series* :15.

Bourdieu Pierre (1983) Forms of capital, in J. Richardson (Ed.) *Handbook of Theory and Research for the Sociology of Education*. New York, Greenwood: 241-258.

Bourdieu Pierre (1997) The Forms of Capital, in: A.H. Halsey, Hugh Lauder, Phillip Brown and Amy Stuart Wells (eds.), *Education: Culture, Economy and Society*, Oxford: Oxford University Press: 46-59.

Buonanno Paolo, Montolio Daniel, Vanin Paolo (2009) Does Social Capital Reduce Crime?. *Journal of Law & Economics*, University of Chicago Press. 52(1):145-170.

Claridge Tristan (2004) Social Capital and Natural Resource Management, Unpublished Thesis, University of Queensland, Brisbane, Australia.

Coleman James Samuel (1988) Social capital in the creation of human capital. *American Journal of Sociology*. 94:S95-S120.

Cote Sylvain, Healy Tom (2001) The Well-being of Nations. The role of human and social capital. Organisation for Economic Co-operation and Development, Paris.

Daly Mary (2000) Social Exclusion as Concept and Policy Template in the European Union, School of Sociology and Social Policy, Queen's University, Belfast, Working Paper Series: 135.

Fukuyama Francis (1995). *Trust: Social Virtues and the Creation of Prosperity*. NY: Free Press.

Grootaert Christiaan, van Bastelaer Thierry (2002) Understanding and measuring social capital: a multidisciplinary tool for practitioners, Washington, The World Bank, 2002.

Friedman Nir, Halpern Joseph Yehuda (1999) Modeling Belief in Dynamic Systems, Part II: Revision and Update, in *Journal of Artificial Intelligence Research* 10:117-167.

Gordon Jack, Jordan Bill (1999) Social Capital and Child Welfare. *Children & Society*. 13(4):242-256.

Green Francis, Machin Steven, Wilkinson David (1996) Trade Unions and Training Practices in British Workplaces, CEP Discussion Papers:278, Centre for Economic Performance, LSE.

Halpern David (2009) *The Hidden Wealth of Nations*. Cambridge: Polity.

Hendryx Michael Shawn, Ahern Melissa, Lovrich Nicholas, McCurdy Arthur (2002) Access to health care and community social capital. *Health Services Research*. 37(1).

Kawachi Ichiro, Subramanian Sankaranarayanan Venkata, de Almeida-Filho Naomar Monteiro (2002) A glossary for health inequalities. *Journal of Epidemiology and Community Health*. 56: 647-652.

Kingston Chris (2005), Social Capital and Corruption: Theory, and Evidence from India, Amherst College.

Lin Nan (1999) Building a Network Theory of Social Capital. *Connections*. 22(1):28-51.

OECD (2001) *The Well-Being of Nations: the Role of Human and Social Capital*, Centre for Educational Research and Innovation, Paris.

Onyx Jenny, Bullen Paul (2000) Measuring Social Capital in Five Communities. *Journal of Applied Behavioral Science*. 36(1):23-42.

Platt Lucinda (2006) Assessing the impact of illness, caring and ethnicity on social activity, *LSE STICERD Research Paper*. CASE 108.

Putnam Robert David, Leonardi Raobert, Nanetti Raffaella (1993) *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.

Putnam Robert David (1995) Bowling Alone: America's Declining Social Capital. *Journal of Democracy* 6(1):65-78.

Wilkinson Richard, Pickett Kate (2009) *The Spirit Level. Why more equal societies almost always do better*. London: Allen Lane.

The World Bank (1999) *What is Social Capital?* PovertyNet
<http://www.worldbank.org/poverty/scapital/whatsc.htm>

Zhou Lin (1999) Subjective probability theory with continuous acts. *Journal of Mathematical Economics*. 32(1):121-130.



FACULTY OF ECONOMIC SCIENCES
UNIVERSITY OF WARSAW
44/50 DŁUGA ST.
00-241 WARSAW
WWW.WNE.UW.EDU.PL